

# Modern researches on Blood Stasis syndrome 1989–2015

## A bibliometric analysis

Jiangquan Liao, PhD<sup>a,b</sup>, Jie Wang, MD, PhD<sup>b,\*</sup>, Yongmei Liu, PhD<sup>b</sup>, Jun Li, MD, PhD<sup>b</sup>, Lian Duan, PhD<sup>a,b</sup>, Guang Chen, PhD<sup>a,b</sup>, Junyuan Hu, MD<sup>a,b</sup>

### Abstract

**Background:** Blood Stasis syndrome (BSS) is one of the major syndromes in Traditional East Asia medicine (TEAM). Modern research of BSS began in the late 1980s.

**Methods:** We searched in PubMed for BSS-related articles published between 1989 and 2015. The publication information, study contents, and bibliometric indicators were documented and analyzed.

**Results:** Most of the BSS-related studies were conducted by Chinese researchers in China. The number of publications on BSS-related increased rapidly in recent years, so did the quality of them. The disease diversity of BSS-related studies increased along with the number of publications. Yet the academic influence of them remained on average low; further, the diagnostic criteria of BSS were not uniform.

**Conclusions:** BSS-related studies have increased in quantity and quality, but there are limitations to them which require improvement in research productivity and academic influence.

**Abbreviations:** BSS = blood Stasis syndrome, CAM = complementary and alternative medicine, CHD = coronary heart disease, CNKI = China national knowledge infrastructure, IF = impact factors, RCT = randomized clinical trial, TCM = Traditional Chinese medicine, TEAM = Traditional East Asia medicine, WOS = web of Science.

**Keywords:** bibliometric analysis, blood stasis syndrome, h-index, traditional East Asia medicine

## 1. Introduction

Blood stasis syndrome (BSS, also known as *Xueyu Zheng* in Chinese or *Oketsu* in Japanese) is one of the major syndromes in Traditional East Asia medicine (TEAM). BSS is the compound of various manifestations including pain that occurs in a fixed location, dark-purple face or tongue, bleeding, blood spots under the skin, and an astringent pulse among other features.<sup>[1]</sup> There are common characteristics and manifestations of BSS in different

diseases. In the theory of TEAM, BSS is usually caused by internal or external factors and leads to disturbance of blood circulation.<sup>[2]</sup> BSS has an important role in TEAM, since it is related to blood, one of the basic elements that nourishes and maintains the body's physiologic functions. Also, it is seen in almost all chronic internal diseases and external injuries.

The first descriptions of BSS can be traced back to over 2000 years ago, where it is found in the *Inner Canon of Huangdi* (about 200 B.C. in China). Throughout the practice of TEAM in eastern Asia, the understanding of BSS evolved gradually. But due to the lack of standard diagnosis criteria, it was difficult to summarize and communicate between different studies. Not just in scientific studies, a uniformed and objective diagnostic method for BSS is essential for clinical diagnosis and treatment.<sup>[2]</sup> BSS is commonly seen in chronic internal diseases and external injuries; hence, the accurate identification and evaluation of BSS and the application of activating blood circulation to dissipate blood stasis are vital to the treatment via TEAM.<sup>[1,3]</sup> The key to achieving this relies on standardized diagnosis criteria which truly reflects the nature of BSS. In the 1980s, standard diagnostic criteria for BSS were officially established by formal academic committees. In 1982, *Tentative diagnostic criterion for BSS* was first established by Specialized Committee of “activating blood circulation” (ABC) in China.<sup>[4]</sup> In Japan, *Diagnostic criteria for Oketsu (blood-stasis) syndrome* was published by Terasawa et al<sup>[5]</sup> in 1983. After years of applications and analyses, revised and relatively more standard diagnostic criteria were established in the late 1980s. In China, the “*diagnostic criteria of Blood-stasis symptom-complex*” was determined and established in the Chinese Association of Traditional Chinese Medicine, by the committee of “promoting blood circulation to remove blood

Editor: Myeong Soo Lee.

**Funding:** This research was supported by the National Natural Science Foundation of China (No. 81673847), and partially supported by the Special Project of Beijing Science and Technology Commission (No. Z161100001816045).

**Authorship:** JL and JW designed the study. GC, LD, and JH searched and extracted the data. YL and JL analyzed the data. JL wrote the manuscript.

The authors have no conflicts of interest to disclose.

<sup>a</sup> Graduate School, Beijing University of Chinese Medicine, Chaoyang District,

<sup>b</sup> Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Xicheng District, Beijing, China.

\* Correspondence: Jie Wang, Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Xicheng District, Beijing, China (e-mail: wangjie0103@126.com).

Copyright © 2016 the Author(s). Published by Wolters Kluwer Health, Inc. All rights reserved.

This is an open access article distributed under the Creative Commons Attribution-No Derivatives License 4.0, which allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to the author.

Medicine (2016) 95:49(e5533)

Received: 23 June 2016 / Received in final form: 5 November 2016 / Accepted: 8 November 2016

<http://dx.doi.org/10.1097/MD.0000000000005533>

stasis” in 1988.<sup>[6]</sup> The next year in Japan, similar diagnostic criteria were established by Terasawa.<sup>[7]</sup> Research on BSS has improved since 1989, with the establishment of the standard diagnosis criteria for BSS. It is reported that BSS is correlated to several pathogeneses including abnormal coagulation function,<sup>[8]</sup> inflammation,<sup>[9]</sup> and accelerated red blood cell senescence.<sup>[10]</sup> Studies that focus on the treatment of BSS are also increasing. With more applicable diagnostic criteria established and the BSS-related studies increased, the inconsistency of BSS diagnostic criteria is drawing researchers’ attention.<sup>[11]</sup>

Since modern research on BSS has been ongoing for >30 years, a systematic summary of them is warranted. To date, reviews on particular aspects of BSS such as certain diseases, biomarkers, and medications have been published. But there has not been any comprehensive recognition of the publication status and quality of BSS-related articles as a whole. Therefore, in this study, we systematically summarized all the articles related to BSS published from 1989 to 2015 in MEDLINE and in English, which are the most used academic database and language, hoping to gain a broad perspective of modern research of BSS.

## 2. Materials and methods

### 2.1. Data sources and searches

Since 1989 was the milestone for modern research of BSS, we searched for all articles related to BSS in PubMed from 1st January 1989 to 31st December 2015. The search term was (“blood stasis syndrome” [All Fields]) AND (“1989/01/01”[PDat]: “2015/12/31”[PDat])). The ethical approval was not necessary since all the data we collected were from those published articles, this research did not involve any privacy of any individual, and the research process would not result in any harm or discomfort to anyone.

### 2.2. Inclusion/exclusion criteria

The articles which were selected should meet all the inclusion criteria as followed:

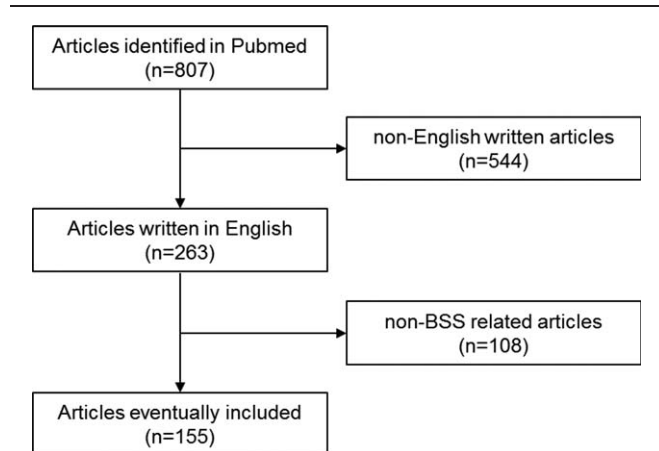
- (1) The definition of BSS in the article was within the theory of TEAM.
- (2) The main content of the article should focus on BSS.
- (3) The article was written in English.
- (4) The publication date should between 1st January 1989 and 31st December 2015.

Those articles not in English or which studied Western medicine-defined blood stasis were not included.

### 2.3. Data extraction

The publication information and bibliometric indicators were collected from those included articles. The documented indices included:

- (1) Publication information, including journal, year of publication, article type, country of author’s affiliation.
- (2) Study contents, including diseases, main subjects of study, characteristics of study, the diagnostic criteria of BSS used in research, intervention if applied.
- (3) Bibliometric indicators, including total cites in Web of Science (WOS), Scopus and Google Scholar respectively, h-index, and the impact factor (IF) of the journal in publication year.



**Figure 1.** Article searching and screening process. The article inclusion process was under the inclusion established in *Materials and Methods* section.

h-index and IF were extracted from WOS and annual Journal Citation Reports (JCR).

Three authors (LD, GC, and JH) participated in articles searching, screening, and data extracting. All of the information extracted were supervised and verified by 1 author (JL). Any discrepancies were discussed among all of the authors for consensus.

### 2.4. Data analysis

Data analysis and visualization were performed via SPSS 17.0 and Microsoft Excel 2010. Data were presented by counts, percentage, and frequency.

## 3. Results

### 3.1. Selection of studies

Searching PubMed with the term of “blood stasis,” we identified 807 items published between 1st January 1989 and 31st December 2015. By reading the title and abstract, we excluded 544 non-English language articles. By reading the abstract and the whole articles, we excluded 108 articles that did not focus on BSS in the theory of TEAM. Eventually 155 articles were included in this analysis. Figure 1 shows the flowchart of article searching and screening. Table 1 shows the detailed information of all the included articles. Tables 2 and 3 show the diagnostic criteria and modeling methods these articles applied in their researches. The number in *Diagnostic criteria/modeling methods* column of Table 1 was referred to those in Tables 2 and 3.

### 3.2. General information of included articles

Among the 155 BSS-related articles, 127 of them (81.94%) were original articles, 22 of them (14.19%) were review (including systematic review and meta-analysis), 6 (3.87%) were others (such as conference abstract, academic opinion). Authors’ affiliations were most commonly in China (144 out of 155, 92.9%). Only 11 articles were authored by authors outside of China, including 7 articles from Japan and 4 articles from Korea. One of the second authors was Norwegian.

Table 1

## General and bibliometric information of included BSS-related articles (sorted by total citation).

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
1	Ultrasonic/microwave assisted extraction and diagnostic ion filtering strategy by liquid chromatography-quadrupole time-of-flight mass spectrometry for rapid characterization of flavonoids in <i>Spatholobus suberectus</i>	<i>J Chromatogr. A</i>	2011	Original article	49	46	70	7	Not mentioned	Not specified	Herbal extract	Not specified	China
2	Herbs of activating blood circulation to remove blood stasis	<i>Clin Hemorheol Microcirc</i>	2000	Review	41	40	55	12	Not mentioned	Not specified	None	Not specified	China
3	A Proteomic Approach for the Diagnosis of "Oketsu" (blood stasis), a Pathophysiologic Concept of Japanese Traditional (Kampo) Medicine	<i>Evid Based Complement Alternat Med</i>	2007	Original article	35	37	59	6	#5	Not specified	None	Human	Japan
4	Pharmacokinetic comparisons of hydroxysafflower yellow A in normal and blood stasis syndrome rats	<i>J Ethnopharmacol</i>	2010	Original article	28	33	42	7	#28	Not specified	Herbal extract	Rat	China
5	Pharmacokinetics of traditional Chinese syndrome and recipe: a hypothesis and its verification (I)	<i>World J Gastroenterol</i>	2000	Original article	28	26	39	11	Not mentioned	Not specified	Herbal formula	Rat	China
6	Buyang Huanwu decoction ameliorates coronary heart disease with Qi deficiency and blood stasis syndrome by reducing CRP and CD40 in rats	<i>J Ethnopharmacol</i>	2010	Original article	22	25	30	10	#30	Coronary heart disease	Herbal formula	Rat	China
7	Blood stasis syndrome and its treatment with activating blood circulation to remove blood stasis therapy	<i>Chin J Integr Med</i>	2012	Academic Exploration	22	20	29	4	#24	Not specified	None	Not specified	China
8	Chinese herb and formulas for promoting blood circulation and removing blood stasis and antiplatelet therapies	<i>Evid Based Complement Alternat Med</i>	2012	Review	20	20	34	5	Not mentioned	Not specified	None	Not specified	China
9	Comparative efficacy of Kaishi-bukuryo-gan and pentoxifylline on RBC deformability in patients with "oketsu" syndrome	<i>Phytotherapy</i>	2003	Original article	20	18	36	7	#5	Not specified	Herbal formula	Human	Japan
10	Traditional Chinese medicine syndrome distribution in chronic hepatitis B populations: a systematic review	<i>Am J Chin Med</i>	2011	Systematic review	18	19	24	8	#2	Hepatitis B	None	Not specified	China

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
11	Differential gene expression profiles in coronary heart disease patients of blood stasis syndrome in traditional Chinese medicine and clinical role of target gene	<i>Chin J Integr Med</i>	2009	Original article	17	13	22	6	#3	Coronary heart disease	None	Human	China
12	Effects of Monascus-fermented rice extract on malignant cell-associated neovascularization and intravasation determined using the chicken embryo chorioallantoic membrane model	<i>Integr Cancer Ther</i>	2010	Original article	16	20	24	4	Not mentioned	Not specified	Herbal extract	Cell	China
13	The effects of Buyang Huanwu Decoction on hemorheological disorders and energy metabolism in rats with coronary heart disease	<i>J Ethnopharmacol</i>	2011	Original article	15	15	21	5	#30	Coronary heart disease	Herbal formula	Rat	China
14	Study on the tongue manifestations for the blood-stasis and toxin syndrome in the stable patients of coronary heart disease	<i>Chin J Integr Med</i>	2011	Original article	15	14	19	5	#1	Coronary heart disease	None	Human	China
15	Effect of Xuefu Zhuyu Capsule on the symptoms and signs and health-related quality of life in the unstable angina patients with blood-stasis syndrome after percutaneous coronary intervention: A Randomized controlled trial	<i>Chin J Integr Med</i>	2010	Original article	15	12	21	5	#3	Coronary heart disease	Patent medicine	Human	China
16	Relationship between platelet activation related factors and polymorphism of related genes in patients with coronary heart disease of blood-stasis syndrome	<i>Chin J Integr Med</i>	2008	Original article	14	10	18	5	#1	Coronary heart disease	None	Human	China
17	Research on the correlation between platelet gelsolin and blood-stasis syndrome of coronary heart disease	<i>Chin J Integr Med</i>	2011	Original article	12	10	17	5	#1	Coronary heart disease	None	Human	China

*(continued)*

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
18	Analysis of plasma proteome from cases of the different traditional Chinese medicine syndromes in patients with chronic hepatitis B	<i>J Pharm Biomed Anal</i>	2011	Original article	11	13	18	4	#10	Hepatitis B	None	Human	China
19	Antiplatelet effects of <i>Spatholobus suberectus</i> via inhibition of the glycoprotein IIb/IIIa receptor	<i>J Ethnopharmacol</i>	2011	Original article	11	12	14	3	Not mentioned	Not specified	Herbal extract	Mouse	Korea
20	Study on syndrome element characteristics and its correlation with coronary angiography in 324 patients with coronary heart disease	<i>Chin J Integr Med</i>	2008	Original article	11	9	17	3	#11	Coronary heart disease	None	Human	China
21	Elevated plasma platelet activating factor, platelet activating factor acetylhydrolase levels and risk of coronary heart disease or blood stasis syndrome of coronary heart disease in Chinese: a case control study	<i>Inflammation</i>	2012	Original article	9	11	14	5	#1	Coronary heart disease	None	Human	China
22	Tumor Microenvironment Varies under Different TCM ZHENG Models and Correlates with Treatment Response to Herbal Medicine	<i>Evid Based Complement Alternat Med</i>	2012	Original article	9	10	20	3	#28	Cancer	None	Rat	China
23	Effect of Chinese drugs for activating blood circulation and detoxifying on indices of thrombosis, inflammatory reaction, and tissue damage in a rabbit model of toxin-heat and blood stasis syndrome	<i>Chin J Integr Med</i>	2011	Original article	8	8	12	2	#32	Coronary heart disease	Patent medicine	Human	China
24	Plasma metabolic biomarkers for syndrome of phlegm and blood stasis in hyperlipidemia and atherosclerosis	<i>J Tradit Chin Med</i>	2012	Original article	8	7	10	2	#14	Hyperlipidemia and atherosclerosis	None	Human	China

(continued)

**Table 1**  
(continued).

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
25	Clinical Distribution and Molecular Basis of Traditional Chinese Medicine ZHENG in Cancer	<i>Evid Based Complement Alternat Med</i>	2012	Review	7	9	15	1	Symptom description	Cancer	None	Not specified	China
26	Metabonomics-based study of clinical and animal plasma samples in coronary heart disease with blood stasis syndrome	<i>Evid Based Complement Alternat Med</i>	2012	Original article	7	8	9	2	#29	Coronary heart disease	None	Chinese miniswine	China
27	The diagnostic criteria of blood-stasis syndrome: considerations for standardization of pattern identification	<i>Chin J Integr Med</i>	2014	Original article	7	7	12	1	Symptom description	Not specified	None	Not specified	China
28	Biomedical mechanisms of blood stasis syndrome of coronary heart disease by systems biology approaches	<i>Chin J Integr Med</i>	2013	Review	7	7	8	1	#4	Coronary heart disease	None	Not specified	China
29	Clinical observation on the effect of Zengse Pill in treating patients with vitiligo of qi-stagnancy and blood-stasis syndrome type	<i>Chin J Integr Med</i>	2008	Original article	7	6	8	4	#18	Vitiligo	Patent medicine	Human	China
30	Effect of Yinian Jiangya Yin on primary hypertension in early stage—a clinical observation on 40 patients	<i>J Tradit Chin Med</i>	2010	Original article	7	5	9	2	#2	Hypertension	Herbal formula	Human	China
31	Therapeutic effect of Chinese herbal medicine for strengthening qi, nourishing yin, and removing stasis on serum osteopontin and quality of life of patients with primary Sjogren's syndrome	<i>Chin J Integr Med</i>	2011	Original article	7	5	8	1	Not mentioned	Primary Sjogren's syndrome	Patent medicine	Human	China
32	Correlation between Fc $\gamma$ R IIIa and aortic atherosclerotic plaque destabilization in ApoE knockout mice and intervention effects of effective components of chuanxiong rhizome and red peony root	<i>Chin J Integr Med</i>	2011	Original article	7	5	7	3	#36	Not specified	Herbal extract	Mouse	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
33	Application of metabolomics on diagnosis and treatment of patients with psoriasis in traditional Chinese medicine	<i>Biochim Biophys Acta</i>	2013	Original article	6	9	21	2	Symptom description	Psoriasis	None	Human	China
34	Progress of experimental study on treatment of psoriasis by Chinese medicinal monomer and single or compound recipe in Chinese materia medica	<i>Chin J Integr Med</i>	2007	Review	6	6	17	2	Not mentioned	Psoriasis	None	Not specified	China
35	Study on clinical effect and mechanism of Jianpi Qingre Huiyu recipe in treating patients with gastric ulcer	<i>Chin J Integr Med</i>	2007	Original article	6	6	8	3	#2	Gastric ulcer	Herbal formula	Human	China
36	Study of the relationship between carotid intima-media thickness and traditional Chinese medicine syndrome of dyslipidemia	<i>Chin J Integr Med</i>	2009	Original article	6	6	7	3	#2	Dyslipidemia	None	Human	China
37	Applied research on serum protein fingerprints for prediction of Qi deficiency syndrome and phlegm and blood stasis in patients with non-small cell lung cancer	<i>J Tradit Chin Med</i>	2012	Original article	6	6	7	0	Symptom description	lung cancer	None	Human	China
38	Combining ZHENG Theory and High-Throughput Expression Data to Predict New Effects of Chinese Herbal Formulae	<i>Evid Based Complement Alternat Med</i>	2012	Original article	5	8	15	3	Not mentioned	Not specified	Patent medicine	Human	China
39	Pharmacokinetic comparisons of berberine and palmatine in normal and metabolic syndrome rats	<i>J Ethnopharmacol</i>	2013	Original article	5	8	9	1	#38	Metabolic syndrome	Herbal formula	Rat	China
40	The protective effects of the active fraction of Shaofu Zhuyu decoction on hydrogen peroxide-induced oxidative injury in vascular smooth muscle cells	<i>Molecules</i>	2010	Original article	5	7	9	2	#34	Not specified	Herbal formula	Rat	China
41	Clinical and Epidemiological Investigation of TCM Syndromes of Patients with Coronary Heart Disease in China	<i>Evid Based Complement Alternat Med</i>	2012	Original article	5	6	10	2	#1	Coronary heart disease	None	Human	China

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
42	The Effect of Sodium Tanshinone IIA Sulfate and Simvastatin on Elevated Serum Levels of Inflammatory Markers in Patients with Coronary Heart Disease: A Study Protocol for a Randomized Controlled Trial	<i>Evid Based Complement Alternat Med</i>	2013	Original article	5	6	10	1	#1	Coronary heart disease	Patent medicine	Human	China
43	A Systems Biology Approach to Characterize Biomarkers for Blood Stasis Syndrome of Unstable Angina Patients by Integrating MicroRNA and Messenger RNA Expression Profiling	<i>Evid Based Complement Alternat Med</i>	2013	Original article	5	5	10	1	#4	Coronary heart disease	None	Human	China
44	Traditional Chinese medicine syndromes of chronic hepatitis B with precore mutant	<i>World J Gastroenterol</i>	2005	Original article	5	3	10	2	#10	Hepatitis B	None	Human	China
45	Energy metabolism disorder and myocardial injury in chronic myocardial ischemia with Qi deficiency and blood stasis syndrome based on 2-DE proteomics	<i>Chin J Integr Med</i>	2012	Original article	4	6	10	1	#29	Coronary heart disease	None	Chinese miniswines	China
46	Effects of Ouyi Xiaoban capsules on clinical outcomes and platelet activation and aggregation in patients with unstable angina pectoris	<i>J Altern Complement Med</i>	2007	Original article	4	5	10	4	Symptom description	Coronary heart disease	Patent medicine	Human	China
47	Water extract of <i>Spatholobus suberectus</i> inhibits osteoclast differentiation and bone resorption	<i>BMC Complement Altern Med</i>	2013	Original article	4	5	7	1	Not mentioned	None	Herbal extract	Cell	Korea
48	Comparative pharmacokinetics of rhein and chrysohanol after oral administration of Ouyi Qingre granules in normal and acute blood stasis rabbits	<i>J Ethnopharmacol</i>	2014	Original article	4	5	4	1	#35	Not specified	Patent medicine	Rabbit	China
49	Blood stasis syndrome in Japan and its molecular biological analysis	<i>Chin J Integr Med</i>	2014	Original article	4	4	7	0	#13	Not specified	None	Human	Japan
50	A clinical epidemiological study of the quantitative diagnosis scale of blood stasis syndrome	<i>Chin J Integr Med</i>	2011	Original article	4	4	6	3	#3	Not specified	None	Not specified	China

(continued)



**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
51	Protective effect of Chinese herbs for supplementing qi, nourishing yin and activating blood circulation on heart function of patients with acute coronary syndrome after percutaneous coronary intervention	<i>Chin J Integr Med</i>	2012	Original article	4	4	6	2	#4	Coronary heart disease	Herbal formula	Human	China
52	The Expression of CD14 (+) CD16 (+) Monocyte Subpopulation in Coronary Heart Disease Patients with Blood Stasis Syndrome	<i>Evid Based Complement Alternat Med</i>	2013	Original article	4	4	5	1	#1	Coronary heart disease	None	Human	China
53	Comparative metabolomics analysis on invigorating blood circulation for herb pair Gui-Hong by ultra-high-performance liquid chromatography coupled to quadrupole time-of-flight mass spectrometry and pattern recognition approach	<i>J Pharm Biomed Anal</i>	2015	Original article	4	4	4	1	#28	Not specified	Herbal formula	Rat	China
54	Study on the relationship between blood stasis syndrome and clinical pathology in 227 patients with primary glomerular disease	<i>Chin J Integr Med</i>	2009	Original article	4	3	6	3	#7	Primary glomerular disease	None	Human	China
55	Exploring molecular mechanism underlying Chinese medicine syndrome: a study on correlation between Chinese medicine syndrome and biomarkers for ischemic stroke	<i>Chin J Integr Med</i>	2013	Original article	4	3	5	0	#26	Stroke	None	Human	China
56	Multifactor dimensionality reduction analysis of the correlation of Chinese medicine syndrome evolution and cardiovascular events in patients with stable coronary heart disease	<i>Chin J Integr Med</i>	2014	Original article	4	3	5	0	#1	Coronary heart disease	None	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
57	Platelet proteomics and its advanced application for research of blood stasis syndrome and activated blood circulation herbs of Chinese medicine	<i>Sci China Life Sci</i>	2013	Review	4	3	4	1	#25	Coronary heart disease	None	Not specified	China
58	Evaluation on quality of life and analysis on its correlation with TCM syndromes in patients of chronic hepatitis B	<i>Chin J Integr Med</i>	2009	Original article	4	1	9	1	#16	Hepatitis B	None	Human	China
59	Use of comparative effectiveness research for similar Chinese patent medicine for angina pectoris of coronary heart disease: a new approach based on patient-important outcomes	<i>Trials</i>	2014	Original article	3	5	5	1	#2	Coronary heart disease	Patent medicine	Human	China
60	Fire-heat and Qi deficiency syndromes as predictors of short-term prognosis of acute ischemic stroke	<i>J Altern Complement Med</i>	2013	Original article	3	5	5	0	#19	Stroke	None	Human	China
61	Chinese medicine improves postoperative quality of life in endometriosis patients: a randomized controlled trial	<i>Chin J Integr Med</i>	2012	Original article	3	4	12	1	#8	Endometriosis	Herbal formula	Human	China
62	Relationship between Blood Stasis Syndrome Score and Cardioankle Vascular Index in Stroke Patients	<i>Evid Based Complement Alternat Med</i>	2012	Original article	3	4	9	2	#5	Stroke	None	Human	Korea
63	Logistic regression analysis of syndrome essential factors in patients with unstable angina pectoris	<i>J Tradit Chin Med</i>	2012	Original article	3	3	6	1	#6	Coronary heart disease	None	Human	China
64	Rule of Chinese medicine syndrome differentiation in the patients with thoracic diseases at perioperation stage	<i>Chin J Integr Med</i>	2011	Original article	3	3	3	3	Not mentioned	Thoracic diseases	None	Human	China
65	Phagocytosis of platelet in coronary heart disease patients with blood-stasis syndrome	<i>Chin Med J</i>	1993	Original article	3	3	3	2	Not mentioned	Coronary heart disease	None	Human	China
66	Chemotherapeutic activities of Carthami Flos and its reversal effect on multidrug resistance in cancer cells	<i>Alr J Tradit Complement Altern Med</i>	2013	Original article	3	2	6	0	Not mentioned	Cancer	Herbal extract	Cell	China
67	Effect of Liangxuehuayu Recipe on hemorheology in rats with blood stasis syndrome	<i>Asian Pac J Trop Med</i>	2012	Original article	3	1	6	1	Not mentioned	Not specified	Herbal formula	Rat	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
68	Analysis on traditional Chinese medicine syndrome elements and relevant factors for senile diabetes	<i>J Tradit Chin Med</i>	2013	Original article	3	1	5	1	#9	Diabetes	None	Human	China
69	Associations of platelet-activating factor acetylhydrolase (PAF-AH) gene polymorphisms with circulating PAF-AH levels and risk of coronary heart disease or blood stasis syndrome in the Chinese Han population	<i>Mol Biol Rep</i>	2014	Original article	3	1	5	0	#1	Coronary heart disease	None	Human	China
70	Clinical study of the hypothesis of endogenous collateral wind on acute coronary syndrome: a review	<i>Alr J Tradit Complement Altern Med</i>	2014	Review	3	1	4	1	Not mentioned	Coronary heart disease	None	Not specified	China
71	The effects of xuei zhuyu and shengmai on the evolution of syndromes and inflammatory markers in patients with unstable angina pectoris after percutaneous coronary intervention: a randomized controlled clinical trial	<i>Evid Based Complement Altern Med</i>	2013	Original article	2	6	13	0	#3	Coronary heart disease	Patent medicine	Human	China
72	Network-based biomarkers for cold coagulation blood stasis syndrome and the therapeutic effects of shaofu zhuo decoction in rats	<i>Evid Based Complement Altern Med</i>	2013	Original article	2	4	5	1	#28	Not specified	Herbal formula	Rat	China
73	Tongue diagnosis of traditional Chinese medicine for rheumatoid arthritis	<i>Alr J Tradit Complement Altern Med</i>	2013	Original article	2	3	6	0	Symptom description	Rheumatoid arthritis	None	Human	China
74	Huangqi-Honghua combination and its main components ameliorate cerebral infarction with Qi deficiency and blood stasis syndrome by antioxidant action in rats	<i>J Ethnopharmacol</i>	2014	Original article	2	3	5	1	#31	Stroke	None	Rat	China
75	Prof. ZHANG YI's experience in treating severe arrhythmia	<i>J Tradit Chin Med</i>	2010	Case report	2	3	3	1	Not mentioned	Arrhythmia	None	Not specified	China
76	A New Biomarkers Feature Pattern Consisting of TNF- $\alpha$ , IL-10, and IL-8 for Blood Stasis Syndrome with Myocardial Ischemia	<i>Evid Based Complement Altern Med</i>	2013	Original article	2	3	3	1	#29	Coronary heart disease	None	Chinese miniswines	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
77	Expression of bcl-2 oncogene in gastric precancerous lesions and its correlation with syndromes in traditional Chinese medicine	<i>World J Gastroenterol</i>	2005	Original article	2	2	10	1	#8	Gastric cancer	None	Human	China
78	Distribution and development of the TCM syndromes in psoriasis vulgaris	<i>J Tradit Chin Med</i>	2009	Original article	2	2	7	1	Symptom description	Psoriasis vulgaris	None	Human	China
79	Pathologic analysis on hyperplasia of mammary gland with different syndromes based on infrared radiation temperature of acupoints	<i>J Tradit Chin Med</i>	2012	Original article	2	2	6	0	#20	Hyperplasia of mammary gland	None	Human	China
80	A Metabonomics Profiling Study on Phlegm Syndrome and Blood-Stasis Syndrome in Coronary Heart Disease Patients Using Liquid Chromatography/Quadrupole Time-of-Flight Mass Spectrometry	<i>Evid Based Complement Alternat Med</i>	2014	Original article	2	2	4	0	Not mentioned	Coronary heart disease	None	Human	China
81	Traditional Chinese medicine syndromes for essential hypertension: a literature analysis of 13,272 patients	<i>Evid Based Complement Alternat Med</i>	2014	Systematic review	2	2	4	0	Not mentioned	Hypertension	None	Not specified	China
82	Innovative Strategy in Treating Angina Pectoris with Chinese Patent Medicines by Promoting Blood Circulation and Removing Blood Stasis: Experience from Combination Therapy in Chinese Medicine	<i>Curr Vasc Pharmacol</i>	2014	Review	2	2	3	0	Not mentioned	Coronary heart disease	None	Not specified	China
83	Effects and Perspectives of Chinese Patent Medicines for Tonicifying Qi and Promoting Blood Circulation on Patients with Cerebral Infarction	<i>Curr Vasc Pharmacol</i>	2014	Systematic review	2	2	2	0	Not mentioned	Stroke	None	Not specified	China
84	Chinese medicine syndrome distribution of chronic hepatitis B virus carriers in immunotolerant phase	<i>Chin J Integr Med</i>	2014	Original article	2	1	4	0	#21	Hepatitis B	None	Human	China
85	A one-year evaluation of radiographic progression in patients with rheumatoid arthritis treated by Qingre Huoxue Decoction	<i>Chin J Integr Med</i>	2011	Original article	2	1	3	0	#2	Rheumatoid arthritis	Herbal formula	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
86	Optimizing prescription of Chinese herbal medicine for unstable angina based on partially observable Markov decision process	<i>Evid Based Complement Alternat Med</i>	2013	Original article	2	1	2	0	#1	Not specified	Herbal formula	Human	China
87	Efficacy of chuanxiong ding tong herbal formula granule in the treatment and prophylactic of migraine patients: a randomized, double-blind, multicenter, placebo-controlled trial	<i>Evid Based Complement Alternat Med</i>	2012	Original article	1	5	9	0	#2	Migraine	Patent medicine	Human	China
88	Relationship between EGF, TGF $\alpha$ , and EGFR Gene Polymorphisms and Traditional Chinese Medicine ZHENG in Gastric Cancer	<i>Evid Based Complement Alternat Med</i>	2013	Original article	1	5	6	0	#27	Gastric cancer	None	Human	China
89	Cortex Moutan Induces Bladder Cancer Cell Death via Apoptosis and Retards Tumor Growth in Mouse Bladders	<i>Evid Based Complement Alternat Med</i>	2013	Original article	1	4	8	1	Not mentioned	Bladder cancer	Herbal extract	Cell	China
90	Aspirin resistance and promoting blood circulation and removing blood stasis: current situation and prospective	<i>Evid Based Complement Alternat Med</i>	2014	Review	1	3	6	1	Not mentioned	Not specified	None	Not specified	China
91	Toxicity and clinical reasonable application of Taoren (Semen Persicae) based on ancient and modern literature research	<i>J Tradit Chin Med</i>	2013	Review	1	3	4	0	Not mentioned	Not specified	None	Not specified	China
92	Blood stasis syndrome of coronary heart disease: A perspective of modern medicine	<i>Chin J Integr Med</i>	2013	Review	1	2	7	0	#4	Coronary heart disease	None	Not specified	China
93	Plasma metabolomics study on Chinese medicine syndrome evolution of heart failure rats caused by LAD ligation	<i>BMC Complement Altern Med</i>	2014	Original article	1	2	4	0	Not mentioned	Heart failure	None	Rat	China
94	Circulating levels of inflammatory cytokines in patients with psoriasis vulgaris of different Chinese medicine syndromes	<i>Chin J Integr Med</i>	2015	Original article	1	2	3	1	#2	Psoriasis vulgaris	None	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
95	Study on correspondence between prescription and syndrome and the essence of phlegm and blood stasis syndrome in coronary heart disease based on metabonomics	<i>Chin J Integr Med</i>	2012	Review	1	2	3	0	Not mentioned	Coronary heart disease	None	Not specified	China
96	Differential expression of microRNA in endothelial cells incubated with serum of hypertension patients with blood-stasis syndrome	<i>Chin J Integr Med</i>	2015	Original article	1	2	2	0	#3	Hypertension	None	Cell	China
97	The Bi-Digital O-Ring Test used in the successful diagnosis & treatment (with antibiotic, anti-viral agents & oriental herbal medicine) of a patient suffering from pain & weakness of an upper extremity and Barré-Liéou syndrome appearing after whiplash injury. A case report	<i>Acupunct Electrother Res</i>	1997	Case report	1	1	3	0	Not mentioned	Not specified	Patent medicine	Not specified	Japan
98	Analysis of clinical syndromes in 47 patients with pancreatic cancer at late stage	<i>J Tradit Chin Med</i>	2011	Original article	1	1	3	0	Not mentioned	Pancreatic cancer	None	Human	China
99	Serum low-density lipoprotein and heart rate related to the effectiveness in the treatment of angina pectoris with two similar Chinese medicine herbal formulae	<i>Chin J Integr Med</i>	2011	Original article	1	1	2	1	#7	Coronary heart disease	Patent medicine	Human	China
100	Study on the relationship between Chinese medicine constitutive susceptibility and diversity of syndrome in diabetic nephropathy	<i>Chin J Integr Med</i>	2013	Original article	1	1	2	0	#22	Diabetes	None	Human	China
101	Relationship between endogenous hydrogen sulfide and blood stasis syndrome based on the Qi-blood theory of Chinese medicine	<i>Chin J Integr Med</i>	2013	Review	1	1	2	0	Symptom description	Not specified	None	Not specified	China
102	Conceptualization and utilization of blood stasis syndrome among doctors of Korean medicine: results of a web-based survey	<i>Am J Transl Res</i>	2015	Original article	1	1	2	0	Not mentioned	Not specified	None	Human	Korea, Norway

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
103	Relationship between various Chinese medicine types and T-cell subsets in patients with ulcerative colitis	<i>Chin J Integr Med</i>	2009	Original article	1	1	1	1	#17	Ulcerative colitis	None	Human	China
104	Latest Study on the Relationship between Pathological Process of Inflammatory Injury and the Syndrome of Spleen Deficiency and Fluid Retention in Alzheimer's Disease	<i>Evid Based Complement Alternat Med</i>	2014	Review	1	1	1	1	Not mentioned	Alzheimer's Disease	None	Not specified	China
105	Correlations among persistent viral infection, heart function and Chinese medicine syndromes in dilated cardiomyopathy patients	<i>Chin J Integr Med</i>	2014	Original article	1	1	1	0	#3	Dilated cardiomyopathy	None	Human	China
106	Development and validation of a UPLC-MS/MS method for the determination of arhydroxsaflor yellow B in rat plasma and its application to pharmacokinetic study	<i>J Chromatogr B Analyt Technol Biomed Life Sci</i>	2015	Original article	1	1	1	0	Not mentioned	Not specified	Herbal extract	Rat	China
107	Accelerated RBC senescence as a novel pathologic mechanism of blood stasis syndrome in traditional East Asian medicine	<i>Am J Transl Res</i>	2015	Review	1	1	1	0	Not mentioned	Not specified	None	Not specified	Korea
108	Association between Glu298Asp677C-T single nucleotide polymorphism in the eNOS/MTHF gene and blood stasis syndrome of ischemic stroke	<i>Gene</i>	2012	Original article	1	1	0	0	#2	Stroke	None	Human	China
109	Relationship between traditional Chinese medicine syndrome differentiation and imaging characterization to the radiosensitivity of nasopharyngeal carcinoma	<i>Chin J Cancer</i>	2010	Original article	0	10	17	0	Symptom description	Nasopharyngeal carcinoma	None	Human	China
110	Therapeutic effects of modified Danggu Sini Decoction on plasma level of advanced glycation end products in patients with Wagner grade 0 diabetic foot: a randomized controlled trial	<i>J Integr Med</i>	2009	Original article	0	8	10	0	#6	Diabetes	Herbal formula	Human	China

(continued)

**Table 1**  
(continued).

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
111	Characteristics of traditional Chinese medicine syndromes in post-stroke depression	<i>J Chin Integr Med</i>	2010	Original article	0	7	12	0	#9	Stroke	None	Human	China
112	Relationship between cytochrome P450 2C19*17 genotype distribution, platelet aggregation and bleeding risk in patients with blood stasis syndrome of coronary artery disease treated with clopidogrel	<i>J Chin Integr Med</i>	2012	Original article	0	6	10	0	#3	Coronary heart disease	None	Human	China
113	Clinical non-inferiority trial on treatment of coronary heart disease angina pectoris of Xin-blood stasis syndrome type with Jophilized Salvia salt of lithospermic acid powder for injection	<i>Chin J Integr Med</i>	2006	Original article	0	6	8	0	Not mentioned	Coronary heart disease	Patent medicine	Human	China
114	Traditional Chinese medicine for prevention and treatment of hepatocarcinoma: From bench to bedside	<i>World J Hepatol</i>	2015	Academic Exploration	0	5	7	0	Not mentioned	Hepatocarcinoma	None	Not specified	China
115	Effects of L. F04, the active fraction of <i>Lycopus lucidus</i> , on erythrocytes rheological property	<i>Chin J Integr Med</i>	2005	Original article	0	4	9	0	#33	Not specified	Herbal extract	Rat	China
116	Intermediate and late rheumatoid arthritis treated by tonifying the kidney, resolving phlegm and removing blood stasis	<i>J Tradit Chin Med</i>	2000	Original article	0	4	5	0	Not mentioned	Rheumatoid arthritis	Patent medicine	Human	China
117	Treatment of nonspecific chronic prostatitis with Qian Lie Xian Yan Suppository	<i>J Tradit Chin Med</i>	2001	Original article	0	3	9	0	#3	Prostatitis	Patent medicine	Human	China
118	Effect of Yinxieling decoction on PASI, TNF- $\alpha$ and IL-8 in patients with psoriasis vulgaris	<i>Asian Pac J Trop Med</i>	2014	Original article	0	3	8	0	Not mentioned	Psoriasis vulgaris	Herbal formula	Human	China
119	A clinical study on the treatment of chronic pelvic inflammation of Qi-stagnation with blood stasis syndrome by Penyanqing capsule	<i>Chin J Integr Med</i>	2005	Original article	0	3	7	0	Not mentioned	Chronic pelvic inflammation	Patent medicine	Human	China

(continued)



**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
120	Effects of Chinese medicine for promoting blood circulation and removing blood stasis in treating patients with mild to moderate vascular dementia: a randomized, double-blind and parallel-controlled trial	<i>J Chin Integr Med</i>	2012	Original article	0	3	6	0	Not mentioned	Vascular dementia	Patent medicine	Human	China
121	Effect of the principle of activating blood circulation to break stasis on GMP-140 and D2 dimer in patients with acute cerebral infarction	<i>Chin J Integr Med</i>	2005	Original article	0	2	15	0	#7	Stroke	Herbal formula	Human	China
122	Effect of Gui-zhi-tu-ling-wan on hot flashes in young patients: a retrospective case series	<i>J Acupunct Meridian Stud</i>	2011	Case report	0	2	7	0	Not mentioned	Hot flashes	Herbal formula	Human	China
123	Effects of Chinese medicinal herbs on hemorheology in diabetics	<i>Proc Chin Acad Med Sci Peking Union Med Coll</i>	1989	Original article	0	2	3	0	Not mentioned	Diabetes	Herbal formula	Human	China
124	Progress of modern research on tumor blood stasis syndrome and its treatment with the method of promoting blood circulation by removing blood stasis	<i>J Tradit Chin Med</i>	1995	Review	0	2	2	0	Not mentioned	Cancer	None	Not specified	China
125	Clinical efficacy of traditional Chinese medicine on acute myocardial infarction: a prospective cohort study	<i>Chin J Integr Med</i>	2012	Original article	0	2	2	0	#1	Coronary heart disease	Herbal formula	Human	China
126	Expression of T-helper 17 cells and signal transducers in patients with psoriasis vulgaris of blood-heat syndrome and blood-stasis syndrome	<i>Chin J Integr Med</i>	2014	Original article	0	1	3	0	#2	Psoriasis vulgaris	None	Human	China
127	30 cases of intractable renal edema treated by removing blood stasis and promoting diuresis	<i>J Tradit Chin Med</i>	1997	Original article	0	1	1	0	#15	Renal edema	Herbal formula	Human	China
128	Combined use of Chinese medicine with allogeneic hematopoietic stem cell transplantation for severe aplastic anemia patients	<i>Chin J Integr Med</i>	2014	Original article	0	1	1	0	Not mentioned	Aplastic anemia	Herbal formula	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
129	Circulating MicroRNA Profiles Differ between Qi-Stagnation and Qi-Deficiency in Coronary Heart Disease Patients with Blood Stasis Syndrome	<i>Evid Based Complement Alternat Med</i>	2015	Original article	0	1	1	0	Not mentioned	Coronary heart disease	None	Human	China
130	Mice Exposed to Chronic Intermittent Hypoxia Simulate Clinical Features of Deficiency of both Qi and Yin Syndrome in Traditional Chinese Medicine	<i>Evid Based Complement Alternat Med</i>	2011	Original article	0	0	11	0	#37	Chronic Intermittent Hypoxia	None	Mouse	China
131	Traditional Chinese medicine syndrome patterns and qi-regulating, chest-relaxing and blood-activating therapy on cardiac syndrome X	<i>J Tradit Chin Med</i>	2013	Original article	0	0	2	0	Not mentioned	Coronary heart disease	None	Human	China
132	A preliminary study of TCM stage-oriented treatment of atherosclerosis	<i>J Tradit Chin Med</i>	2009	Review	0	0	1	0	Not mentioned	Atherosclerosis	None	Not specified	China
133	Exploration of the mechanism of pattern-specific treatments in coronary heart disease with network pharmacology approach	<i>Comput Biol Med</i>	2014	Original article	0	0	1	0	Not mentioned	Coronary heart disease	None	Not specified	China
134	Constructing protein-protein interaction network of hypertension with blood stasis syndrome via digital gene expression sequencing and database mining	<i>J Integr Med</i>	2014	Original article	0	0	1	0	#3	Hypertension	None	Rat	China
135	The association between blood lipid and plegm turbidity syndrome of angina pectoris: a systematic review and meta-analysis	<i>Complement Ther Med</i>	2014	Systematic review	0	0	1	0	Not mentioned	Coronary heart disease	None	Not specified	China
136	Complex networks approach for analyzing the correlation of traditional Chinese medicine syndrome involvement and cardiovascular events in patients with stable coronary heart disease	<i>Evid Based Complement Alternat Med</i>	2015	Original article	0	0	1	0	#1	Coronary heart disease	None	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
137	A study of the immunofunction in patients of coronary heart disease with the fundamental deficiency and outward excess syndrome	<i>J Tradit Chin Med</i>	1989	Original article	0	0	0	0	#12	Coronary heart disease	None	Human	China
138	Effects of the integrated TCM-WM treatment of nephrotic syndrome on growth and sexual development	<i>J Tradit Chin Med</i>	2000	Original article	0	0	0	0	#6	Nephrotic syndrome	Herbal formula	Human	China
139	Acoustic features for identifying constitutions in traditional Chinese medicine	<i>J Altern Complement Med</i>	2012	Original article	0	0	0	0	Not mentioned	Not specified	None	Human	China
140	Variations of energy metabolism and adenosine triphosphatase activity in gastric mucosa in chronic atrophic gastritis rats with Qi deficiency and blood stasis syndrome and effect of Zhiweifangbian capsule	<i>J Tradit Chin Med</i>	2013	Original article	0	0	0	0	Not mentioned	Chronic atrophic gastritis	Patent medicine	Rat	China
141	Standardization and future directions in pattern identification research: International brainstorming session	<i>Chin J Integr Med</i>	2014	Conference	0	0	0	0	Not mentioned	Not specified	None	Not specified	Korea
142	Correlativity between blood measures related to blood stasis blocking collaterals and gene expression of angiotensin-converting enzyme of renal cortex in diabetic rats and effect of stasis removing and collaterals dredging	<i>J Tradit Chin Med</i>	2014	Original article	0	0	0	0	Not mentioned	Diabetes	Patent medicine	Rat	China
143	CUPID: a protocol of a randomised controlled trial to identify characteristics of similar Chinese patent medicines	<i>BMJ Open</i>	2014	Original article	0	0	0	0	Not mentioned	Not specified	Patent medicine	Human	China
144	Pharmacokinetics and tissue distribution study of tanshinone IIA after oral administration of Bushen Huoxue Qubi granules to rats with blood stasis syndrome	<i>Pharmacogn Mag</i>	2014	Original article	0	0	0	0	#28	Not specified	Herbal extract	Rat	China

(continued)

**Table 1**  
**(continued).**

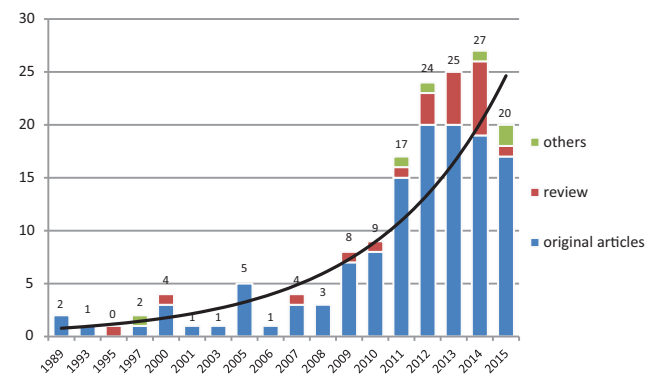
No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/ modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
145	The Effect of Xuefuzhiyu Oral Liquid on Aspirin Resistance and Its Association with rs5911, rs5787, and rs3842788 Gene Polymorphisms	<i>Evid Based Complement Alternat Med</i>	2015	Original article	0	0	0	0	#1	coronary heart disease	patent medicine	Human	China
146	Effect of yangxinkang tablets on chronic heart failure: A multi-center randomized double-blind placebo-controlled trial	<i>Chin J Integr Med</i>	2015	Original article	0	0	0	0	#2	Heart failure	Patent medicine	Human	China
147	Pi (Spleen)-deficiency syndrome in tumor microenvironment is the pivotal pathogenesis of colorectal cancer immune escape	<i>Chin J Integr Med</i>	2015	Academic Exploration	0	0	0	0	Not mentioned	Colorectal cancer	None	Not specified	China
148	Evaluating the effects of Danhong injection in treatment of acute ischemic stroke: study protocol for a multicenter randomized controlled trial	<i>Trials</i>	2015	Original article	0	0	0	0	Not mentioned	Stroke	Patent medicine	Human	China
149	Therapeutic effect and apoptosis mechanism of lung-tonifying and expectorant decoction on lung cancer rats with Qi deficiency and blood stasis	<i>Asian Pac J Trop Med</i>	2015	Original article	0	0	0	0	Not mentioned	Lung cancer	Herbal formula	Rat	China
150	The Clinical Relevance of Serum NDKA, NMDA, PARK7, and UFDL Levels with Phlegm-Heat Syndrome and Treatment Efficacy Evaluation of Traditional Chinese Medicine in Acute Ischemic Stroke	<i>Evid Based Complement Alternat Med</i>	2015	Original article	0	0	0	0	Not mentioned	Stroke	None	Human	China
151	Understanding the molecular aspects of oriental obesity pattern differentiation using DNA microarray	<i>J Transl Med</i>	2015	Original article	0	0	0	0	Not mentioned	Obesity	None	Human	Korea
152	The Mechanism Research of Qishen Yiqi Formula by Module-Network Analysis	<i>Evid Based Complement Alternat Med</i>	2015	Original article	0	0	0	0	Not mentioned	Not specified	None	Not specified	China
153	Relationship between serum estrogen levels and blood stasis syndrome in postmenopausal women with coronary heart disease	<i>Pak J Med Sci</i>	2015	Original article	0	0	0	0	not mentioned	Coronary heart disease	None	Human	China

(continued)

**Table 1**  
**(continued).**

No.	Title	Journal	Publication year	Article type	WOS citation	Scopus citation	Google Scholar citation	h-index	Diagnostic criteria/modeling methods	Diseases	Intervention	Subjects of research	Country of authors' affiliation
154	Effect of Huanshui Recipe Oral Liquid on renal dysfunction progression in patients with atherosclerotic renal artery stenosis	<i>Chin J Integr Med</i>	2015	Original article	0	0	0	0	Not mentioned	Kidney disease	Patent medicine	Human	China
155	A multicenter, randomized, double-blind clinical study on Wufuxiniaoqing Soft Capsule in treatment of chronic stable angina patients with blood stasis syndrome	<i>Chin J Integr Med</i>	2015	Original article	0	0	0	0	#23	Coronary heart disease	Patent medicine	Human	China

BSS = blood stasis syndrome, WOS = web of science.



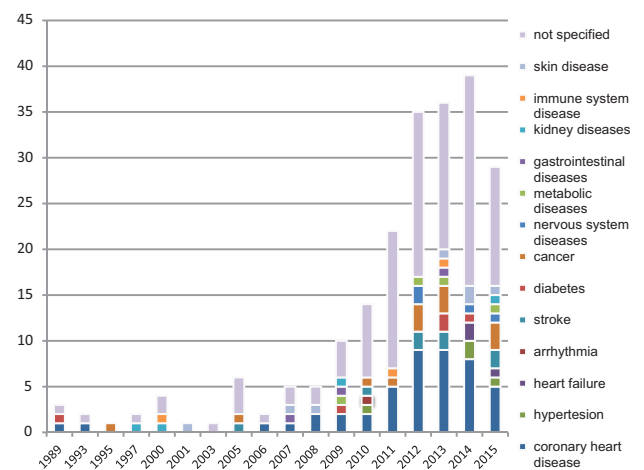
**Figure 2.** Annual publication and articles types of BSS-related articles. Different types of articles were addressed in different colors; the trend line of publications was also drawn. BSS = blood stasis syndrome.

The year of publication is graphed in Fig. 2. An increase of publication is observed from 2009, with a peak from 2012 to 2014.

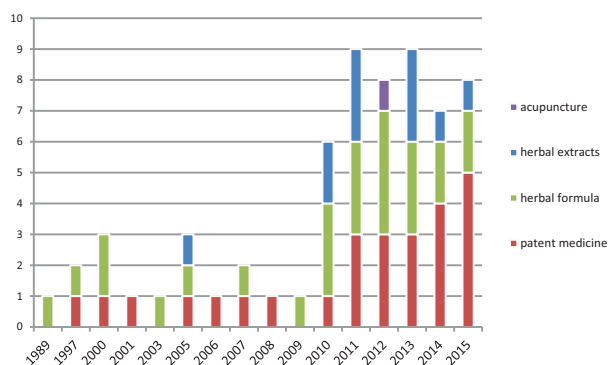
### 3.3. Diseases categories

The names of diseases were documented and classified into different categories according to the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10, version 2016).<sup>[12]</sup> Among the 155 BSS-related articles, 112 (72.26%) were not specified to particular diseases, 46 (29.68%) articles focused on coronary heart disease (CHD), which was the largest proportion in disease classification. Followed by 13 (8.39%) in different types of cancer/tumor, 8 (5.16%) in stroke, 7 (4.52%) in skin diseases, 5 (3.23%) in diabetes, 4 (2.58%) in hypertension, metabolic diseases, nervous system diseases, and kidney diseases respectively, 3 (1.94%) in heart failure and gastrointestinal diseases, respectively, and 1 (0.65%) in arrhythmia. Cardiovascular diseases were the most common disease categories, especially CHD. Such results coincided with the epidemiology of clinical BSS<sup>[13]</sup> and reflected the high interest in CHD-BSS in BSS studies.

The number of articles focused on cardiovascular diseases increased rapidly from 2010 (Fig. 3). Although the number of publications gradually increased (Fig. 2), the range of disease categories broadened, and the gaps between different diseases



**Figure 3.** Disease classification of BSS-related articles. Different diseases were addressed in different colors. BSS = blood stasis syndrome.



**Figure 4.** Intervention-year variation of BSS-related articles. Interventions including patent medicine, herbal formula, herbal extracts, and acupuncture were addressed in different colors. BSS = blood stasis syndrome.

were shortened, these results indicate a growth of diversity in BSS studies.

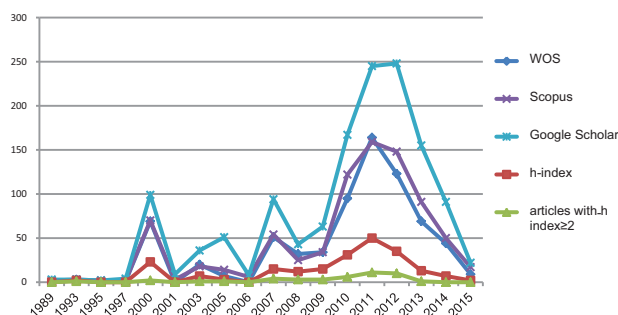
### 3.4. Research content and Intervention categories

Among the 155 BSS-related articles, there were 90 articles using humans as research subjects in clinical trials. In total, 58 (64.44%) out of the 90 focused on the BSS syndrome, including syndrome characteristics, syndrome distribution in different diseases, and syndrome differentiation. However, 32 (35.56%) out of the 90 articles focused on efficacy evaluation and comparison of different interventions. Also, 18 articles applied the rules of randomized clinical trial (RCT). It is noteworthy that there were 12 RCTs published in the last 5 years. On the other hand, more comprehensive and profound omics technologies were used in recent years. Twenty-four BSS-related articles explored the BSS characteristics or intervention via genomics, transcriptomics, proteomics, and metabolomics, mostly published since 2012. The contents and technologies contained in the articles show the quality and depth of BSS-related researches increased accordingly as more articles were published.

Despite the range of research subjects, there were 63 articles that applied interventions, including 26 (41.27% of 63) patent medicine (pill, capsule, poulder, injection, so on), 25 (39.68%) herbal formula, 11 (17.46%) herbal extracts, and 1 (1.59%) acupuncture. The variation of intervention-year can be seen in Fig. 4. Though the total amounts of patent medicine and herbal formula are close, the number of studies on patent medicine increased in recent years while the proportion of herbal formula shrank. With the modern exploration of TEAM developing, studies with patent medicines seem to be improving, with results that appear more convincing.<sup>[14–16]</sup> Herbal medicine is also one of the vital components in TEAM. It is more widely used in clinical practice. With the growth in BSS-related research, it is necessary to improve and expand herbal formula research.

### 3.5. Academic influence analysis

The total number of citations and the h-index of every BSS-related article were extracted from WOS, Scopus, and Google Scholar. There were 721, 820, and 1343 cites in WOS, Scopus, and Google Scholar for the 155 BSS-related articles respectively, averagely 4.65, 5.29, and 8.66 cites for each article. According to the citation-year analysis (Fig. 5), the annual citation amount was low before 2009 and has increased since 2010. Citation is related



**Figure 5.** Academic influence indices in every year. Total citation in WOS, Scopus and Google Scholar, h-index, and amount of article has h-index  $\geq 2$  were presented in the line chart. WOS = web of science.

to the articles' quality, publication type, and research content. The significant increase of citation after 2010 might be due to the increase of both numbers of publications and research quality.

A peak in citations in 2000 was contributed by 2 relatively high-quality articles published in influential journals. One of them was a review of herbal products with the function of promoting blood circulation and removing blood stasis. The other was a pharmacokinetics analysis on herbal formulae.

The Schubert h-index (h-index) was introduced by András Schubert in 2009.<sup>[17]</sup> It has been widely used to measure the direct and indirect citation influence of single publications. Normally an article with h-index  $\geq 2$  is considered influential. The average h-index of 155 BSS-related articles is 1.39. There are 43 (27.74%) articles with h-index  $\geq 2$ . Only 3 articles' h-index were higher than 10. As can be seen in Fig. 5, the tendency of the h-index coordinated with the total number of citations, but articles with h-index  $\geq 2$  are seldom, the proportion of influential articles are small, despite the number of publications and study quality increasing.

### 3.6. Diagnostic criteria diversity

The diagnostic criteria or definition of BSS in the included articles were documented. Though the basic recognitions and definitions of BSS were similar among different countries, regions, and research groups, the diagnostic criteria used in different studies were strikingly inconsistent. Of all the 155 BSS-related articles, 59 articles did not mention the diagnostic criteria or definition of BSS they implied, 38 of which were original articles (29.92% of all the original articles). Among the rest of BSS-related articles, a total of 27 different kinds of diagnostic criteria were applied in human related researches respectively (Table 2), and 11 different methods were used in animal or cell modeling experiments (Table 3).

Among the 27 different diagnostic criteria for BSS, 9 were established by national or state academic committees, 5 were established by ministerial or provincial agencies, 3 were from text books, and the rest of them were published in journals by individual authors. Among these diagnostic criteria, *The Criterion of Chinese Medicine Syndrome-differentiation for CHD* by Cardiovascular Branch of Chinese Association of Integrative Western & Chinese Medicine (1991),<sup>[18]</sup> *Guiding principle of clinical research on new drugs of TCM* by Ministry of Health, China (2002),<sup>[19]</sup> and *The diagnostic criteria of blood stasis syndrome* by Special Committee of Promoting Blood

**Table 2****Applied diagnostic criteria for BSS (sorted by frequency).**

No.	Diagnostic criteria	Year of establishment	Frequency
#1	The Criterion of CM Syndrome-differentiation for CHD by Cardiovascular Branch of Chinese Association of Integrative Western and Chinese Medicine	1991	13
#2	Guiding principle of clinical research on new drugs of TCM by Ministry of Health, P. R. China	2002	11
#3	The diagnostic criteria of blood stasis syndrome by Special Committee of Promoting Blood Circulation and Removing Blood Stasis, Chinese Association of Integrative Medicine	1987	9
#4	Study on the diagnostic criteria of blood stasis syndrome by Wang J et al.	1988	4
#5	The presentation of diagnostic criteria for "Yuxie" (stagnated blood) conformation by Terasawa et al	1989	3
#6	Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine by State Administration of Traditional Chinese Medicine	1994	3
#7	Research on cardiocerebrovascular diseases by Chen KJ et al	1998	3
#8	Guidelines for clinical research of new drugs of traditional Chinese medicine by Ministry of Health of the People's Republic of China	1993	2
#9	Internal medicine of Traditional Chinese Medicine by Wang YY	1997	2
#10	The standards of TCM differential syndromes of viral hepatitis by Internal Medicine Hepatopathy Committee of Chinese Traditional Medicine Association	1991	2
#11	Tentative Standard on TCM Syndrome-Differentiation-Based Treatment of Coronary Artery Disease	1980	1
#12	Criteria for diagnosis and treatment of diseases by Wang ZH et al	1983	1
#13	The presentation of diagnostic criteria for "Oketsu" syndrome by Terasawa K	1983	1
#14	Terminology of traditional Chinese medicine clinical diagnosis and treatment. GB/T16751.2-1997.	1985	1
#15	Nephropathy forum of Traditional Chinese Medicine in Nanjing	1986	1
#16	Standard for TCM syndrome differentiation of patients with viral hepatitis by Special Committee of Internal Medicine on Hepatopathy, Chinese Association of Traditional Chinese Medicine	1992	1
#17	Standard of integrative medical diagnosis, syndrome differentiation and efficacy evaluation for chronic non-specific ulcerative Colitis by Professional Committee of digestive diseases, Chinese Association of Integrative Chinese and Western Medicine	1994	1
#18	Diagnosis, syndrome classification and criteria for efficacy of Baibofeng	1994	1
#19	TCM Syndrome Differentiation Diagnostic Criteria for Apoplexy by Ren ZL et al	1994	1
#20	The eighth meeting of the Professional Committee for Breast Diseases of China TCM Surgery Society	2002	1
#21	Traditional Chinese medicine syndromes of chronic hepatitis B with precore mutant by Yang HZ et al	2005	1
#22	Exploration of the research method for Chinese medicine syndrome questionnaire of diabetic nephropathy by Mou X et al	2007	1
#23	Guidelines of clinical research technology in treatment of angina pectoris with Chinese medicine or natural medicine by China Food and Drug Administration	2011	1
#24	The Grading System in Quantifying Blood Stasis Syndrome Diagnosis Standards by Chinese Association of Integrative Medicine	2012	1
#25	Study on the diagnostic criteria for coronary heart disease patients of blood stasis syndrome by Fu CG et al.	2012	1
#26	Ischemic Stroke CM Syndrome Factor Diagnostic Scale by Gao Y et al	2012	1
#27	Syndrome description of gastric cancer-in terms of TCM syndrome differentiation by Yang YP	2012	1

BSS = blood stasis syndrome.

Circulation and Removing Blood Stasis, Chinese Association of Integrative Western & Chinese Medicine (1987)<sup>[20]</sup> were used most frequently (in 13, 11, and 9 studies respectively). Though 104 articles stated the BSS diagnostic criteria they used, only 10 articles listed the detailed diagnostic terms or scales, the rest only named the diagnostic criteria with references. Other than this, 8 studies relied on clinical judgment, which is based on the judgment of >1 practitioner.

In the basic animal and cell experimental studies, 11 different techniques were used to simulate the state of BSS, including adrenaline hydrochloride injection and ice-water soak, artificial myocardial infarction or middle cerebral artery occlusion,

exhaustive swimming exercising, metabolic syndrome via diet control, hypoxia, H<sub>2</sub>O<sub>2</sub>-induced oxidative injury and so forth. Though some of the techniques were used in several studies, there are unresolved questions about the validity of these experimental approaches in BSS research as well as problems in the inconsistency of the research approach applied in different studies.

#### 4. Discussion

This bibliometric analysis summarized modern research on BSS from 1989 to 2015. It contains all of the BSS-related articles in

**Table 3****Animal and cell modeling methods.**

No.	Animal or cell modeling approach	Frequency
#28	Adrenaline hydrochloride injection and ice-water soak	5
#29	Artificial chronic myocardial infarction	3
#30	Exhaustive swimming exercising	2
#31	Artificial middle cerebral artery occlusion	1
#32	Bovine serum albumin injection and high-fat diet feed	1
#33	Dextran injection via caudal vein	1
#34	H <sub>2</sub> O <sub>2</sub> -induced oxidative injury	1
#35	High molecular dextran injection	1
#36	High-fat diet	1
#37	Hypoxia	1
#38	Metabolic syndrome via diet control (water with 20% sucrose and food with high sugar, fat, and salt)	1

PubMed written in English, including clinical trials, cross-sectional studies, case series, case reports, reviews, academic opinions, and so forth. Our findings show that there were few studies on BSS in English in PubMed for an extended period, with a significant growth from 2009 peaking between 2012 and 2014. With the growth in publication, the amount of different types of articles increased accordingly, especially clinical trials and experimental studies.

Our findings also show that despite the concept of BSS being common within the different branches of TEAM, BSS-related articles in these years are mostly authored by Chinese researchers. So far the academic concept and scholarly communication of BSS are mostly under the theory of Traditional Chinese medicine (TCM, one of the main components and origin of TEAM). It is beneficial to explore BSS in united academic system, but cooperation and communication between countries and groups in different disciplines and diseases are also vital for the development and promotion of the research products.

A wide range of diseases not limited to CHD, hypertension, stroke, different types of cancer, diabetes, arrhythmia, obesity, dyslipidemia, gastric ulcer, hepatitis B, psoriasis, primary glomerular disease, and rheumatoid arthritis were addressed in BSS-related studies. Most of these are chronic internal diseases. In the theory of TEAM, BSS is most commonly seen in chronic illness.<sup>[13,21,22]</sup> Continuous disturbances of the inner environment can lead to impaired blood circulation and cause BSS. Hence, BSS is the major syndrome of the above chronic diseases.

Though the number of publications and their citations of BSS-related studies increased in recent years, the academic influence of these still remains relatively low. The average citation for each article is 4.65 to the search date of this study. 27.74% of the articles had h-index higher than 2, only 3 articles' h-index were higher than 10. The proportion of influential articles is small, especially as the number of publications and quality of the studies are increasing. Of all the BSS-related articles contained in PubMed, 97 out of the 155 articles were published in 3 journals (*Chinese Journal of Integrative Medicine*, *Evidence Based Complementary and Alternative Medicine*, and *Journal of Traditional Chinese Medicine*), whose IFs are between 0.5 and 2. The fact that most studies are published in only 3 complementary and alternative medicine (CAM) journals indicates a probable reason for the low impact of the research. Had the studies been published more widely and especially in non-CAM more mainstream journals, they would have gotten a wider audience and received more attention. It is thus important for authors of future studies to plan their studies more carefully

with an eye to targeting publication in more mainstream journals with higher impact factors. This, in turn, will require a further raising of standards for research.

We also found that of all the BSS-related articles, one-third did not state the diagnostic criteria of BSS, the authors only claimed the presence of BSS, or gave a simple description of it. For those that stated the criteria they used in their researches, the diagnostic criteria varied with up to 27 different kinds established by different academic committees and agencies. Though some of them are different editions of the same criteria, the inconsistency of the BSS diagnostic criteria is highly problematic. This inconsistency has weakened the comparability and the validity of BSS-related studies. Different inclusion criteria may lead to different research Results. In the animal and cell experiments, the different modeling methods similarly weaken the findings and their impact. Those articles without specific diagnostic criteria tend to have lower numbers of citations in WOS, Scopus, and Google Scholar than the average and especially those with developed criteria. Furthermore, the fact that many BSS criteria were established in China may be an indication that there is significant disagreement within China. Such circumstances might be one of the reasons that slow progress of recognition and citation and the low academic interest were achieved in BSS-related researches for the past decades. Thus, of major concern is the notion that while there is clinical agreement about the presence and use of BSS in treatment, the scientific community has not yet identified all its varieties. In that case, a globally applicable concept of BSS and well-reckoned diagnostic criteria are needed to comprehensively cover different diseases, gender, living and working environment, cultural factors, and so on. It is evidently that some biomarkers have been identified and recommended for pattern identification in different diseases, syndromes, and populations.<sup>[3]</sup> Using unique biomarkers to subsidiarily identify BSS and its subtypes is an objective approach to eliminate these differences.

Modern research on BSS has been conducted over recent decades. In our overview of publications, we see that it is the right time to integrate the resources and enhance the quality and productivity of BSS-related studies. For future studies, we have some recommendations. First, cooperation between different groups in different fields, and countries need to increase to address some of the issues raised by our review. Second, studies to establish a uniform validated standard for diagnosis and evaluation criteria of BSS are needed. More investigation and cooperation is needed to achieve this. Third, once this standard has been developed and validated more objective biomarkers for



BSS need to be identified. More objective biomarkers are the key to the modernization of BSS in medical practice. Fourth, clinical and experimental studies on BSS should be more objective, scientific, apply more restricted rules, and advanced technologies. Fifth, studies of BSS should return to clinical practice, do they result in enhanced treatment of BSS? The efficacy and safety evaluation of existing herbal formulae, patent medicines, and extracts, as well as the development of new drugs for BSS are important.

There are some limitations in our study. We only included articles published between 1989 and 2015, since we aimed to focus on the modern researches of BSS under validated diagnosis criteria, which were published in the late 1980s. However, the articles that we have found did not all follow these same criteria and in fact there are wide range of different criteria and inconsistency in how BSS has been identified in the studies. This weakens our findings, but at the same time reveals the need for further studies. Additionally, publication bias was also a limitation in this study. We only included articles written in English, which are more likely read by the researchers worldwide. This is because one of the intentions of this research is to estimate the exploration and the promotion of BSS worldwide, English is the most suitable language to evaluate the outcomes. Thus, we did not include articles published in the *China national knowledge infrastructure* (CNKI), China, which contain a large quantity of BSS-related articles in Chinese. We plan to perform a comparative search between Medline and CNKI to analysis the BSS-related articles' variations between English and Chinese in the future.

## 5. Conclusions

To sum up, the publication of BSS-related articles increased continuously, especially in the last 5 years. Study quality has improved along with the number of publications. The diversity of BSS-related studies increased, whereas CHD-BSS is still the most researched area. Intervention studies of BSS inclined more to patent medicine; more attention should be drawn to herbal formulae as well. The diagnostic criteria for BSS are still not unified. With the basis of increasing numbers of publications, studies with high impact are still seldom. The researchers need to consider how to increase the productivity and expand the influence of their research products while finishing the study; key among this will be addressing the issue of inconsistency of criteria to identify BSS.

## Acknowledgment

The authors sincerely thank Prof. Stephen Birch for thoroughly modifying the manuscript.

## References

- [1] Chen KJ. Blood stasis syndrome and its treatment with activating blood circulation to remove blood stasis therapy. *Chin J Integr Med* 2012;18:891–6.
- [2] Park B, Yun KJ, Jung J, et al. Conceptualization and utilization of blood stasis syndrome among doctors of Korean medicine: results of a web-based survey. *Am J Transl Res* 2014;6:857–68.
- [3] Li JG, Xu H. Incorporating pattern identification of Chinese medicine into precision medicine: An integrative model for individualized medicine. *Chin J Integr Med* 2015;21:807–10.
- [4] The First Term Conference of Chinese Association of Integrated Traditional and Western Medicine Tentative diagnostic criterion for BSS. *Chin J Integr Tradit West Med (Chin)* 1983;3: inside front cover.
- [5] Terasawa K, Shinoda H, Imadaya A, et al. The presentation of diagnostic criteria for Oketsu syndrome. *Jpn J Orient Med* 1983;34:1–7.
- [6] Wang J, Chen KJ, Wong WL, et al. Research on diagnostic criteria of Blood-stasis symptom-complex. *J Integr Trad Chin Western Med* 1988;10:585–7; +589+580.
- [7] Terasawa K. The presentation of diagnostic criteria for “Yu-xie” (stagnated blood) conformation. *Int J Oriental Med* 1989;14: 194–213.
- [8] Liu Y, Yin HJ, Shi DZ, et al. Chinese herb and formulas for promoting blood circulation and removing blood stasis and antiplatelet therapies. *Evid Based Complement Alternat Med* 2012;2012:184503.
- [9] Shen BQ, Situ Y, Huang JL, et al. A clinical study on the treatment of chronic pelvic inflammation of Qi-stagnation with blood stasis syndrome by Penyanqing capsule. *Chin J Integr Med* 2005;11:249–54.
- [10] You S, Park B, Lee MS. Accelerated RBC senescence as a novel pathologic mechanism of blood stasis syndrome in traditional East Asian medicine. *Am J Transl Res* 2015;7:422–9.
- [11] Choi TY, Jun JH, Park BK, et al. Concept of blood stasis in Chinese medical textbooks: a systematic review. *Eur J Integr Med* 2016; 8:158–64.
- [12] World Health Organization. International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10 Version 2016). 2016. Available at: <http://apps.who.int/classifications/icd10/browse/2016/en/#/> (accessed May 5, 2016).
- [13] Yao KW, Chu FY, Wang J. A clinical epidemiological study of the quantitative diagnosis scale of blood stasis syndrome. *Chin J Integr Med* 2011;17:200–4.
- [14] Li X, Zhang J, Huang J, et al. A multicenter, randomized, double-blind, parallel-group, placebo-controlled study of the effects of qili qiangxin capsules in patients with chronic heart failure. *J Am Coll Cardiol* 2013;62:1065–72.
- [15] Zhang L, Liu Y, Lu XT, et al. Traditional Chinese medication Tongxinluo dose-dependently enhances stability of vulnerable plaques: a comparison with a high-dose simvastatin therapy. *Am J Physiol Heart Circ Physiol* 2009;297:H2004–14.
- [16] Jia Y, Huang F, Zhang S, et al. Is danshen (*Salvia miltiorrhiza*) dripping pill more effective than isosorbide dinitrate in treating angina pectoris? A systematic review of randomized controlled trials. *Int J Cardiol* 2012;157:330–40.
- [17] Schubert A. Using the h-index for assessing single publications. *Scientometrics* 2009;78:559–65.
- [18] Cardiovascular Institute of Traditional Chinese Medicine Professional Committee The criterion of CM syndromedifferentiation for CHD. *J Integr Tradit West Med (Chin)* 1991;11:257–8.
- [19] Ministry of Health, P. R. China Guiding principle of clinical research on new drugs of TCM. 2002; Beijing: China Medic-Pharmaceutical Sciences and Technology Publishing House, 85.
- [20] Special Committee of Promoting Blood Circulation and Removing Blood Stasis, Chinese Association of Integrative Medicine The diagnostic criteria of blood stasis syndrome. *Chin J Integr Tradit West Med (Chin)* 1987;7:129.
- [21] Ren Y, Zhang M, Chen K, et al. Clinical and epidemiological investigation of TCM syndromes of patients with coronary heart disease in China. *Evid Based Complement Alternat Med* 2012; 2012:714517.
- [22] Yu G, Wang J. Blood stasis syndrome of coronary heart disease: a perspective of modern medicine. *Chin J Integr Med* 2014;20: 300–6.